

MULTIPLE-ANTENNA COMMUNICATION SYSTEMS AND METHODS  
FOR COMMUNICATING IN WIRELESS LOCAL AREA NETWORKS  
THAT INCLUDE SINGLE-ANTENNA COMMUNICATION DEVICES

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Abstract of the Disclosure

In a wireless local area network (WLAN) that includes high-throughput communication devices with multiple antennas and legacy communication devices with single antennas, training tones are transmitted over a plurality of spatial channels during a first portion of an orthogonal frequency division multiplexed (OFDM) packet-training preamble. The training tones are interspersed among subcarrier frequencies of the spatial channels. The training tones are retransmitted during a second portion of the packet-training preamble. The training tones are shifted among the subcarrier frequencies of the spatial channels during the retransmission allowing a high-throughput receiving station to perform a channel estimation on different subcarrier frequencies of the spatial channels. The legacy communication devices may receive and process the training tones and may set their network allocation vector to refrain from communicating during a subsequent interval.

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